

AGRICULTURAL EDUCATION

Indiana State Approved Course Titles and Descriptions

Indiana Department of Education
College and Career Readiness
151 West Ohio Street
Indianapolis, IN 46204

AGRICULTURAL EDUCATION

Agriculture academic content standards are at:

<http://dc.doe.in.gov/Standards/AcademicStandards/PrintLibrary/agriculture.shtml>

Teacher Requirements are available at:

<http://www.doe.in.gov/educatorlicensing/pdf/AssignmentCode.pdf>

Introduction

Agricultural Education is an active part of the curriculum for many high schools in Indiana. This program area combines the home, the school and the community as the means of education in agriculture and natural resources. The courses provide students with a solid foundation of academic knowledge and ample opportunities to apply this knowledge through classroom activities, laboratory experiments and project applications, supervised agricultural experiences, and the FFA.

The vision and mission of Agricultural Education is that all people value and understand the vital role of agriculture, food, fiber and natural resource systems in advancing personal and global well-being and that students are prepared for successful careers and a lifetime of informed choices in agriculture.

The goals for Agricultural Science and Business students focus on providing learning experiences that will allow them to:

- Demonstrate desirable work ethics and work habits.
- Apply the basic agricultural competencies and the basic background knowledge in agriculture and related occupations.
- Analyze entrepreneurial, business, and management skills needed by students preparing to enter agriculture and related occupations.
- Expand leadership and participatory skills necessary for the development of productive and contributing citizens in our democratic society.
- Gain effective social and interpersonal communication skills.
- Be aware of career opportunities in agriculture and set career objectives.
- Acquire job-seeking, employability, and job-retention skills.
- Advance in a career through a program of continuing education and life-long learning.
- Apply the basic learning skills in reading, writing, thinking, mathematics, communicating, listening, and studying.
- Recognize the interaction of agriculture with governments and economic systems at the local, state, national, and international levels.
- Recognize how new technologies impact agriculture and how agriculture impacts the environment.

It is important to understand and reaffirm that career-technical experiences do not preclude students from going on to higher education; in fact participation actually enhances the opportunity. A growing number of students are combining both college preparation and work-place experiences in their high school preparation. Agricultural Science and Business and the FFA programs have a long history of successfully preparing students for entry level careers and further education and training in the science, business and technology of agriculture. The programs combine classroom instruction and hands-on career focused learning to develop students' potential for premier leadership, personal growth, and career success.

FFA

The FFA is the career and technical education student organization that is an integral part of the instruction and operation of a total agricultural education program. As an intra-curricular organization

and essential component of the total program, the local agricultural education teacher(s) serve as the FFA chapter advisors. The many activities of the FFA parallel the methodology of the instructional program and are directly related to the occupational goals and objectives. As an integral part of the instructional program, district and state level FFA activities provide students opportunities to demonstrate their proficiency in the knowledge, skills, and attitudes they have acquired through the agricultural science and agricultural business total program. Agricultural education students demonstrating a high degree of competence in state level FFA activities are highly encouraged to represent their local communities, districts, and state by participating in national FFA activities.

Instructional activities of the FFA require participation of the agricultural science and agriculture business education students as an integral part of an agricultural education course of instruction and, therefore, may be considered an appropriate use and amount of the allotted instructional time.

Indiana Young Farmers' Association (IYFA)

The Indiana Young Farmers' Association was founded in 1962 and is dedicated to furthering the educational, social, and personal opportunities of all individuals interested or involved in the agricultural industry. It acts as an avenue for continuous educational experiences for adults, so that they can take full advantage of the possibilities available in the world of agriculture. IYFA supports the needs of agricultural-based, rural communities by providing worthwhile community services, effective leadership training, and wholesome social and recreational activities for the entire family through involvement in various local, state and national activities. The mission of the Indiana Young Farmer program is to provide the opportunity to agriculturists to enter the industry as well as upgrade the skills needed to be leaders in their chosen occupation, provide opportunities for personal and professional growth through lifelong adult education, serving those who have a common interest in Indiana agriculture.

ADVANCED LIFE SCIENCE, ANIMALS (L)

5070

(ALS ANIML)

Advanced Life Science, Animals, is a standards-based, interdisciplinary science course that integrates biology, chemistry, and microbiology in an agricultural context. Students enrolled in this course formulate, design, and carry out animal-based laboratory and field investigations as an essential course component. Students investigate key concepts that enable them to understand animal growth, development and physiology as it pertains to agricultural science. This course stresses the unifying themes of both biology and chemistry as students work with concepts associated with animal taxonomy, life at the cellular level, organ systems, genetics, evolution, ecology, and historical and current issues in animal agriculture. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to biology and chemistry in highly advanced agricultural applications of animal development.

- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Biology and Chemistry due to course content standards
- Credits: A two semester course, one credit per semester
- Fulfills a Core 40 Life Science requirement for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas or counts as an Elective or Directed Elective for any diploma

ADVANCED LIFE SCIENCE, FOODS (L)

5072

(ALS FOODS)

Advanced Life Science, Foods, is a standards-based, interdisciplinary science course that integrates biology, chemistry, and microbiology in an agricultural context. Students enrolled in this course formulate, design, and carry out food based laboratory and field investigations as an essential course component.

Students understand how biology, chemistry, and physics principles apply to the composition of foods, food nutrition and development, food processing, and storage. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to biology, physics and chemistry the context of highly advanced agricultural applications of food.

- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Biology and Chemistry due to course content standards
- Credits: A two semester course, one credit per semester
- Fulfills a Life Science or Physical Science requirement for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas or counts as an Elective or Directed Elective for any diploma

ADVANCED LIFE SCIENCE, PLANTS AND SOILS (L)

5074

(ALS PLT/SL)

Advanced Life Science, Plants and Soils, is a standards-based, interdisciplinary science course that integrates the study of advanced biology, chemistry, and earth science in an agricultural context. Students enrolled in this course formulate, design, and implement agriculturally-based laboratory and field investigations as an essential course component. These extended laboratory and literature investigations focus on the chemical reactions of matter in living and nonliving materials while stressing the unifying themes of chemistry and the development of physical and mathematical models of matter and its interactions. Using the principles of scientific inquiry, students examine the internal structures, functions, genetics and processes of living plant organisms and their interaction with the environmental. Students completing this course will be able to apply the principles of scientific inquiry to solve problems related to both biology and chemistry in the context of highly advanced agricultural applications of plants and soils.

- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Chemistry and Biology
- Credits: A two semester course, one credit per semester
- Fulfills a Core 40 Life Science requirement for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas or counts as an Elective or Directed Elective for any diploma
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas

AGRIBUSINESS MANAGEMENT

5002

(AG BUS MGMT)

Agribusiness Management is a yearlong course that presents the concepts necessary for managing an agriculture-related business from a local and global perspective. Concepts covered in the course include: exploring careers in agribusiness, global visioning, applying E-commerce, risk management, understanding business management and structures, entrepreneurship, the planning, organizing, financing, and operation of an agribusiness, economic principles, credit, computerized record keeping, budgeting, fundamentals of cash flow, federal, state, property and sales tax, insurance, cooperatives, purchasing, the utilization of information technology in agribusiness, marketing agricultural products, developing a marketing plan, advertising and selling products and services, understanding consumers and buying trends, agricultural law applications and employability skills.

- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Fundamentals of Agricultural Science and Business. Agribusiness Management semesters should be taken in sequential order, however are not required to be taken consecutively.

- Credits: A two-credit course over two semesters.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

AGRICULTURAL MECHANIZATION (AG MECH)

5088

Agricultural Mechanization is a yearlong, lab intensive course in which students develop an understanding of basic principles of selection, operation, maintenance, and management of agricultural equipment in concert with utilization of safety and technology. Topics covered include: small and large gas and diesel engine repair, power transfer systems including hydraulic, pneumatic and robotic systems, arc, metal fabrication such as MIG, TIG and SMAW welding, concrete, wood, metal, electricity and electronics, recirculating aquaculture systems, hydroponics systems, surveying, precision farming equipment, remote sensing technology and global positioning systems equipment, building agriculture related buildings and structures including greenhouses, tillage, planting, irrigation, spraying, grain and forage harvesting, feed and animal waste management systems, agricultural industry communications and customer relations, safety and safety resources, career opportunities in the area of agricultural mechanization and employability skills.

- Recommended Grade Levels: 10-12
- Recommended Prerequisite: Fundamentals of Agricultural Science and Business or by permission of the teacher.
- Credits: A two credit course over two semesters. This course can be offered for a second full year at an advanced level and may also be offered in a two or three hour block for four semesters with a maximum of twelve credit hours.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas

ANIMAL SCIENCE (ANML SCI)

5008

This course is a yearlong program that provides students with an overview of the field of animal science. Students participate in a large variety of activities and laboratory work including real and simulated animal science experiences and projects. Areas that the students study may be applied to both large and small animals. Topics to be addressed include: anatomy and physiology, genetics, reproduction and biotechnology, nutrition, aquaculture, careers in animal science, animal health, meeting environmental requirements of animals, and management practices for the care and maintenance of animals.

- Recommended Grade Levels: 10-12
- Recommended Prerequisite: Fundamentals of Agricultural Science and Business or by permission of teacher.
- Credits: A two-credit/ two-semester course This course can be offered for a second full year at an advanced level and may also be offered in a two or three hour block with a maximum of six credit hours.
- Animal Science may be offered as a small animal/large animal course and or include an advanced, local content specific application such as aquaculture.
- Fulfills a Life Science requirement for the General Diploma only or counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diploma

FARM MANAGEMENT (FARM MGMT)

5022

Farm Management is a yearlong course that introduces students to the principles of farm organization and management with the utilization of technology. It covers the effects of good and poor management on a farm, economic principles, decision-making, methods for organizing and planning, getting started in the farming business, farm record keeping systems, risk management, and career opportunities in the field of farm management.

- Recommended Grade Levels: 11-12
- Recommended Prerequisite: Fundamentals of Agricultural Science and Business or by permission of the teacher
- Credits: A two-credit/ two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas

FOOD SCIENCE (*FOOD SCI*)

5102

This course is a yearlong program that provides students with an overview of food science and its importance. Introduction to principles of food processing, food chemistry and physics, nutrition, food microbiology, preservation, packaging and labeling, food commodities, food regulations, issues and careers in the food science industry help students understand the role that food science plays in the securing of a safe, nutritious, and adequate food supply. A project-based approach is utilized along with laboratory, team building, and problem solving activities to enhance student learning.

- Recommended Grade Level: Grade 11-12
- Recommended Prerequisites: Fundamentals of Agricultural Science and Business.
- Credits: A two credit course over two semesters.
- Fulfills a Life Science or Physical Science requirement for the General Diploma only or counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

FUNDAMENTALS OF AGRICULTURAL SCIENCE AND BUSINESS (*FUND AG BUS*)

5056

Fundamentals of Agricultural Science and Business is a yearlong course that is highly recommended as a prerequisite and foundation for all other agricultural classes. The nature of this course is to provide students with an introduction to careers and the fundamentals of agricultural science and business.

Areas to be covered include: agricultural literacy, its importance and career opportunities, plant and soil science, environmental science, horticulture and landscape management, agricultural biotechnology, agricultural science and business tools and equipment, basic principles of and employability in the agricultural/horticultural industry, basic agribusiness principles and skills, developing leadership skills in agriculture, and supervised experience in agriculture/horticulture purposes and procedures. Student learning objectives are defined. Instruction includes not only agriculture education standards but many academic standards are included through the use of “hands-on” problem-solving individual and team activities.

- Recommended Grade Level: Grade 9-12
- Recommended Prerequisites: None. Credits:
- A two-credit/ two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

HORTICULTURAL SCIENCE (HORT SCI)

5132

Horticultural Science is a yearlong course designed to give students a background in the field of horticulture and its many career opportunities. It addresses the biology and technology involved in the production, processing, and marketing of horticultural plants and products. Topics covered include: reproduction and propagation of plants, plant growth, growth media, hydroponics, floriculture and floral design, management practices for field and greenhouse production, interior plantscapes, marketing concepts, production of herbaceous, woody, and nursery stock, fruit, nut, and vegetable production, integrated pest management and employability skills. Students participate in a variety of activities including extensive laboratory work usually in a school greenhouse.

- Recommended Grade Level: Grade 10-12
- Recommended Prerequisites: Fundamentals of Agricultural Science and Business.
- Credits: A two-credit/ two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.
- Fulfills a Life Science requirement for the General Diploma only or counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

LANDSCAPE MANAGEMENT (LAND MGMT)

5136

Landscape Management is a yearlong course that provides the student with an overview of the many career opportunities in the diverse field of landscape management. Students are introduced to the procedures used in the planning and design of a landscape using current technology practices, the principles and procedures involved with landscape construction, the determination of maintenance schedules, communications, management and employability skills necessary in landscaping operations, and the care and use of equipment utilized by landscapers. Upon completion of the program plus learning and demonstrating other skills, students have the opportunity to receive an industry approved State Certificate of Mastery in Landscape Management.

- Recommended Grade Levels: 10-12
- Recommended Prerequisite: None. This course can be offered for a second full year at an advanced level and may also be offered in a two or three hour block for four semesters with a maximum of twelve credit hours.
- Credits: A two-credit/two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

NATURAL RESOURCE MANAGEMENT (NAT RS MGMT)

5180

This course is a yearlong program that provides students with a background in natural resource management. Students are introduced to career opportunities in natural resource management and related industries, understanding forest ecology importance, recognizing trees and their products, tree growth and development, forest management, measuring trees, timber stand improvement and urban forestry, soil features, erosion and management practices, conservation practices, water cycles, uses, quality standards, reducing water pollution, conducting water quality tests, watersheds, and its importance to natural resource management, hazardous waste management, native wildlife, waterfowl, wetlands, and fish management, topography map use, management of recreational areas, game bird and animal management, outdoor safety, and weather. "Hands-on" learning activities encourage students to investigate areas of environmental concern including: identification and management of ecosystems,

natural succession identification, natural communities, recycling and management of waste in the environment, soil conservation management practices, land uses, and air quality.

- Recommended Grade Level: Grade 10-12
- Recommended Prerequisites: Fundamentals of Agricultural Science and Business
- Credits: A two-credit/two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.

PLANT AND SOIL SCIENCE

5170

(PLT SL SCI)

Plant and Soil Science is a yearlong course that provides students with opportunities to participate in a variety of activities including laboratory work. Topics covered include: the taxonomy of plants, the various plant components and their functions, plant growth, plant reproduction and propagation, photosynthesis and respiration, environmental factors affecting plant growth, integrated pest management plants and their management, biotechnology, the basic components and types of soil, calculation of fertilizer application rates and procedures for application, soil tillage and conservation, irrigation and drainage, land measurement, grain and forage quality, cropping systems, precision agriculture, principles and benefits of global positioning systems and new technologies, harvesting, and career opportunities in the field of plant and soil science.

- Recommended Grade Level: Grade 10-12
- Recommended Prerequisites: Fundamentals of Agricultural Science and Business or by permission of the teacher.
- Credits: A two-credit/two-semester course
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas.
- Fulfills a Life Science requirement for the General Diploma only or counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas

SUPERVISED AGRICULTURAL EXPERIENCE

5228

(SAE)

Supervised Agricultural Experience (SAE) is designed to provide students with opportunities to gain experience in the agriculture field(s) in which they are interested. Students should experience and apply what is learned in the classroom, laboratory, and training site to real-life situations. Students work closely with their agricultural science and business teacher(s), parents, and/or employers to get the most out of their SAE program. This course can be offered each year as well as during the summer session. SAE may be offered as a Cooperative Education Program. Curriculum content and competencies should be varied so that school year and summer session experiences are not duplicated.

- Recommended Grade Levels: 10-12
- Recommended Prerequisite: Fundamentals of Agricultural Science and Business
- Credits: A maximum of eight credits may be earned in this course when offered as a “non-co-op,” one hour course over eight semesters, some of which can be earned during summer sessions. Curriculum content and competencies should not be duplicated when multiple credits are being earned.
- Credits: A maximum of twelve credits may be earned in this course when offered as an SAE Cooperative Education course (one credit for related instruction and two credits for on the job training – over four semesters = 12 credit hours). On the job training credit hours may be increased in approved situations.
- Counts as a Directed Elective or Elective for the General, Core 40, Core 40 with Academic Honors and Core 40 with Technical Honors diplomas